

Service  
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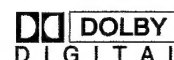


PHIL -05402

FR966/00S



# Service Manual



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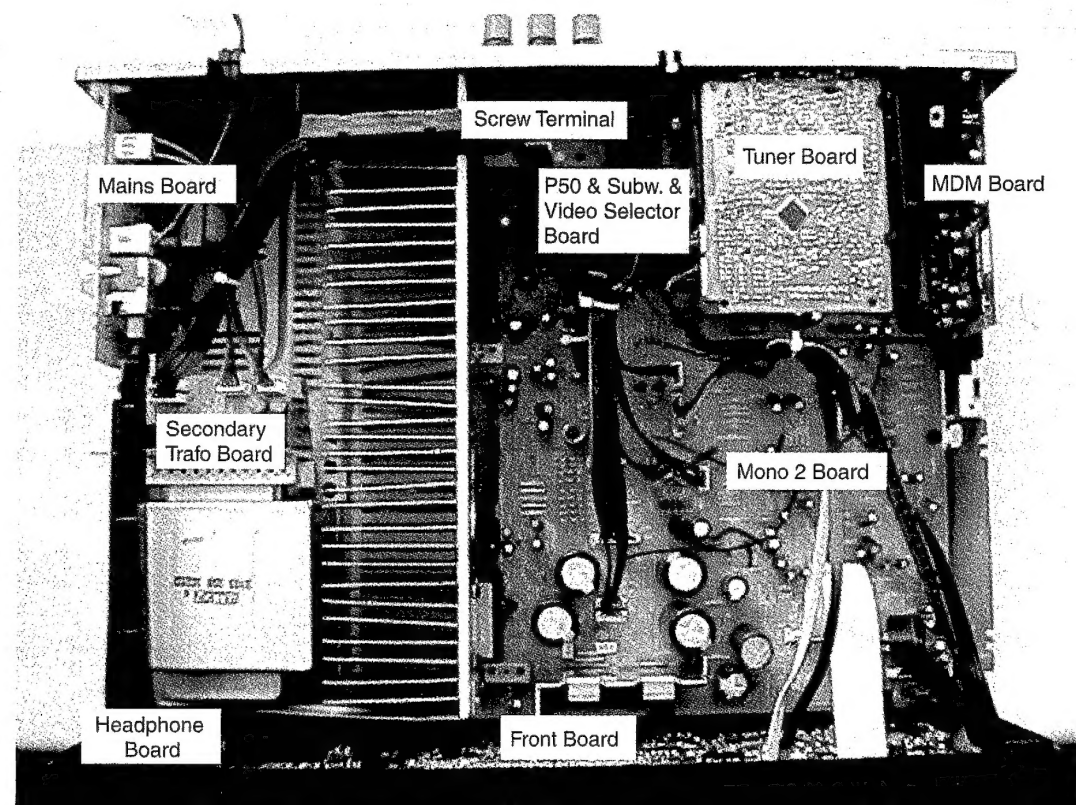
Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified be used.

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# PHILIPS

## LOCATION OF PRINTED CIRCUIT BOARDS



**SPECIFICATION FR965/00**

## General

Mains voltage	: 230V
Mains frequency	: 50Hz
Power consumption	: ≤ 2W at stby
Dimension. wxhxd	: 435x138x350 mm
Remote control	: Multibrand/Universal

## Amplifier

Output power	
Stereo mode (L+R)	: 2x60W DIN (1kHz, 0,7%THD, 6Ω)
Surround mode	
L+R	: 2x60W (1kHz, 0,7%THD, 6Ω)
Center	: 60W (1kHz, 0,7%THD, 6Ω)
Surround Left + Right	: 2x60W (1kHz, 0,7%THD, 6Ω)
Distortion (5W)	
1kHz	: ≤ 0,05%
40Hz -20kHz	: ≤ 0,2%
Headphone	: 6,3mm stereo jack with switch
Output level	: 3V EMF, 60Ω
Crosstalk between source - 1kHz	: ≤ -65dB
(1W) 250Hz – 10kHz	: ≤ -60dB
Crosstalk between channels -1kHz	: ≤ -55dB
(1W) 250Hz – 10kHz	: ≤ -50dB
Frequency response	: ≤ 10Hz – ≥ 30kHz (-1dB)
Power stage protection	: Shortcircuit
	: DC (Vout ≥ 10V) for ±1sec
Temperature	: Transformer (≥140° Celcius)
	: Heatsink (≥ 140° Celcius)

## Audio Selector

Input sensitivity		
Phono	:	5mV impedance 47kΩ/220pf
CD	:	250mV impedance ≥ 47kΩ
CDR/TAPE	:	250mV impedance ≥ 47kΩ
VCR	:	250mV impedance ≥ 47kΩ
TV	:	250mV impedance ≥ 47kΩ
SAT	:	250mV impedance ≥ 47kΩ
6CH/DVD	:	250mV impedance ≥ 47kΩ
Output level		
CDR/TAPE	:	250mV impedance ≤ 1kΩ
VCR	:	250mV impedance ≤ 1kΩ
Output level (variable)		
Subwoofer pre-out	:	800mV impedance ≤ 1kΩ
Center pre-out	:	800mV impedance ≤ 1kΩ

## Digital Selector

Input : 2 x cinch  
Output : 1 x optical  
          : 1 x cinch

## Video Selector CVBS

Input sensitivity		
DVD/VCR/TV	: 1 Vpp	impedance 75Ω
Output level		
Monitor/VCR	: 1 Vpp	impedance 75Ω
Frequency response	: ≤ 50Hz	→ ≥ 6MHz

## Tone controle

Loudness  
(volume  $\leq -20\text{dB}$  Ref: 1kHz=0dB) : 100Hz +6 dB  
: 10kHz +2,5 dB

Tone control (Ref: 1kHz=0dB)  
: Bass 100Hz -9dB  $\rightarrow$  +9dB  
: Treble 10kHz -9dB  $\rightarrow$  +9dB

### Multi Channel Decoder - MDM2000

MPEG5.1 / MPEG 7.1 (7.1 downmix to 5.1)  
 Dolby Digital (AC-3)  
 Digital Theater Systems (DTS)  
 Linear PCM (up to 96kHz, 24 bits resolution)  
 Automatic audio/data type detection (AC-3,dts,MPEG-2,PCM)  
 Dolby Pro Logic  
 MPEG-2 dual mono channel selection I/II  
 Virtual Dolby Surround (422/423)  
 Virtual MPEG Digital (522/523)  
 Virtual Dolby Digital (522/523)  
 Virtual DTS Surround (522/523)  
 Multi - Front / Multi - rear / Natural Surround  
 Digital Bass Management  
 Parallel Stereo Downmix  
 Four Stereo (224)  
 Volume Control  
 Noise Generator (test tone)  
 Surround mode selector  
 Delay Center and Surround Left , Surround Right

**Tuner-** (Tuner95)

RDS	: Only in /00
FM	
Tuning range	: 87.5 – 108MHz
Grid	: 50kHz
IF frequency	: 10.7MHz $\pm$ 25kHz
Aerial input	: 75 $\Omega$ coaxial
Sensitivity at 26dB S/N	: $\leq 2\mu\text{V}$
Selectivity at 300kHz	: $\geq 55\text{dB}$
Image rejection	: $\geq 100\text{dB}$
Distortion at RF=1mV,dev.75kHz	: $\leq 0,8\%$
-3dB Limiting point	: $\leq 2\mu\text{V}$
Crosstalk at RF=1mV,dev.40kHz	: $\geq 35\text{dB}$

## MW

Tuning range	: 531 - 1602kHz
Grid	: 9kHz
IF frequency	: 450kHz $\pm$ 1kHz
Aerial input	: Frame aerial
Sensitivity at 26dB S/N	: $\leq 1.5\text{mV/m}$
Selectivity at 9kHz	: $\geq 23\text{dB}$
IF rejection	: $\geq 50\text{dB}$
Image rejection	: $\geq 33\text{dB}$
Distortion at RF=50mV, m=80%	: $\leq 3\%$

LW only in /00

Tuning range	: 153 - 279kHz
Grid	: 3kHz
IF frequency	: 450kHz $\pm$ 1kHz
Aerial input	: Frame aerial
Sensitivity at 26dB S/N	: $\leq$ 2,8mV/m
Selectivity at 9kHz	: $\geq$ 26dB
IF rejection	: $\geq$ 100dB
Image rejection	: $\geq$ 45dB
Distortion at RF=50mV, m=80%	: $\leq$ 3%dB

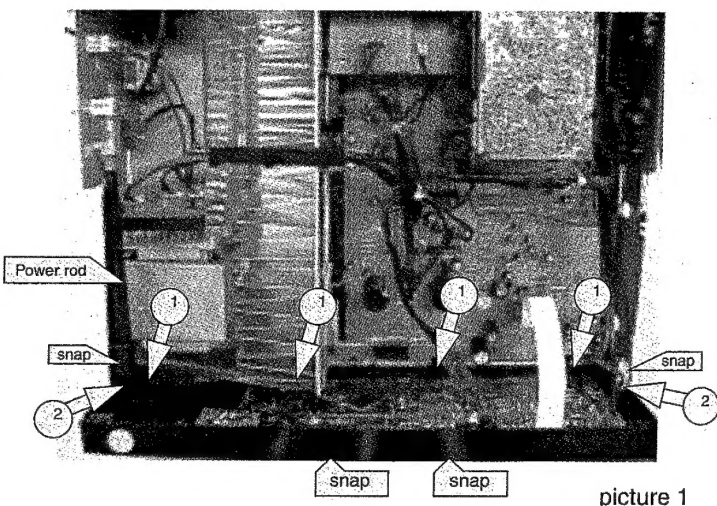
## VERSION VARIATIONS

Features & Board in used	Type & Versions	FR965 = FR966 except colour	
		FR965/00	FR966/00S
Front colour		Black	Silver



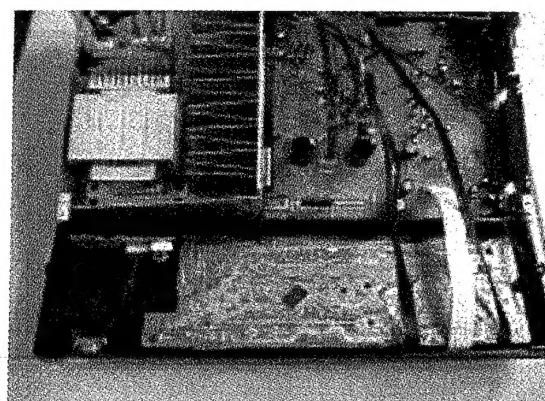
## DISMANTLING HINTS

## Dismantling of Front



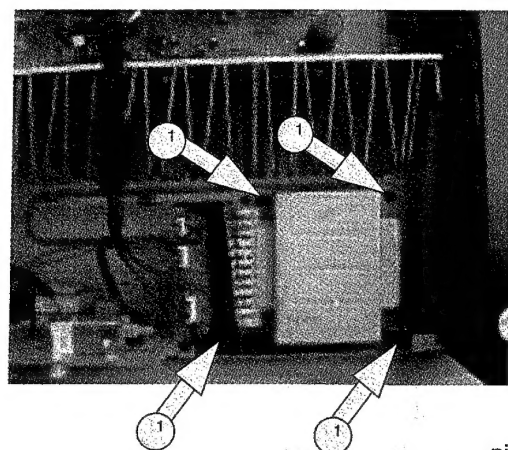
picture 1

- 1) Remove top cover
- 2) Remove power rod
- 3) Remove 6 x screw as shown in picture 1
- 4) Release two snaps (left & right side front)
- 5) Release two snaps on the bottom side front
- 6) Tilt down front as shown in picture 2



picture 2

## Dismantling of mainstrafo

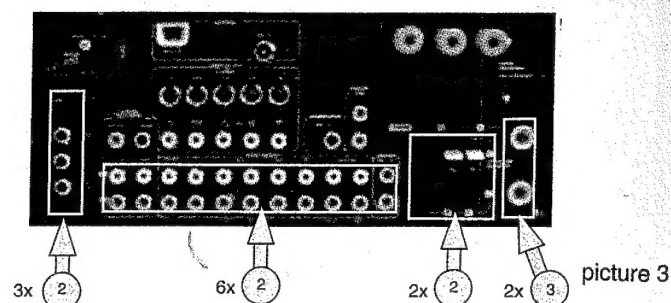


picture 8

- 1) Remove power rod
- 2) Remove 4x screw as shown in picture 8

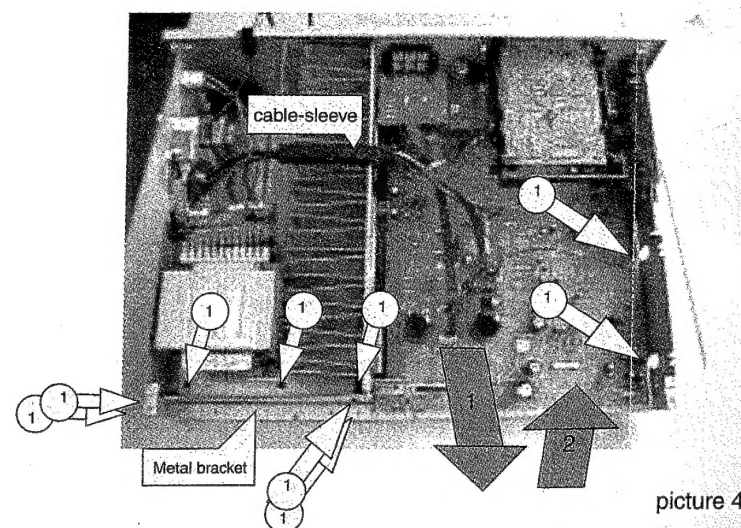
## Dismantling of mono board

- 1) Remove front . See picture 1
- 2) Remove whole front (disconnect the wires on the mono board coming from front)



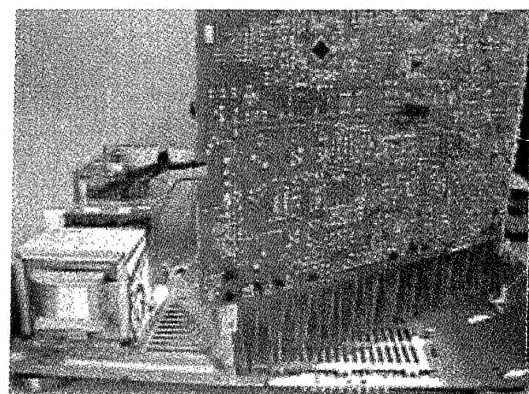
picture 3

- 3) Remove 13 x screws shown in mentioned area . See picture 3



picture 4

- 4) Remove wires out the cable-sleeve.
- 5) Remove 7 x screw and remove metal bracket
- 6) Remove 2 x screw on mono board . See picture 4
- 7) Remove mono board as shown arrow 1 & 2 . See picture 4
- 8) Bring the mono board in the service position as shown in picture 5



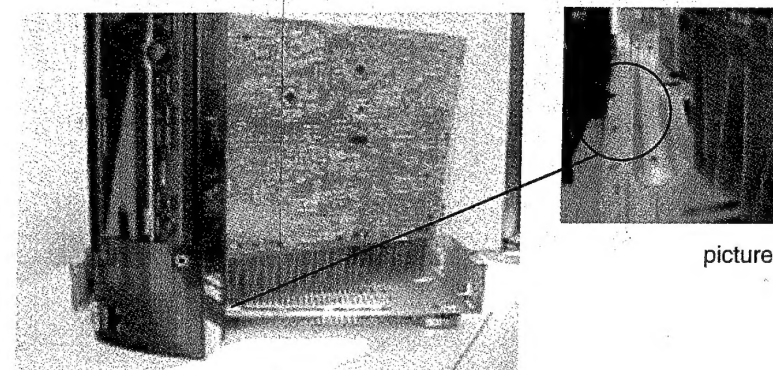
picture 5

## Legend

- (1) → = Torx M3x6mm ( screw with big head )  
 (2) → = Torx 3x10mm  
 (3) → = Torx M3x6mm

## Service position monoboard

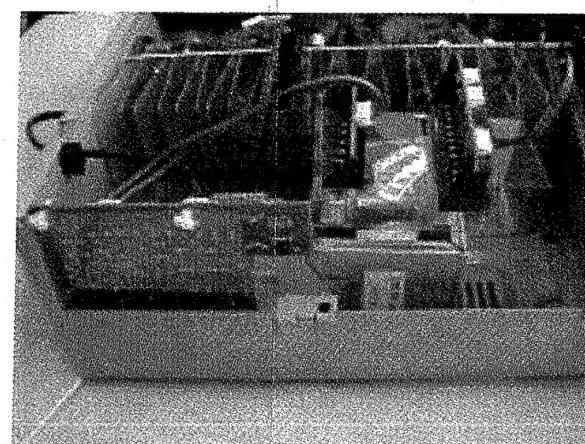
- 1) Bring front in position as shown in picture 6
  - 2) Snap nok of front in bottom to make front stable . See picture 7
  - 3) Connect front wiring back to monoboard.
- \*The tuner module doesn't have to be connected. Use an other source (pe.CD)



picture 7

picture 6

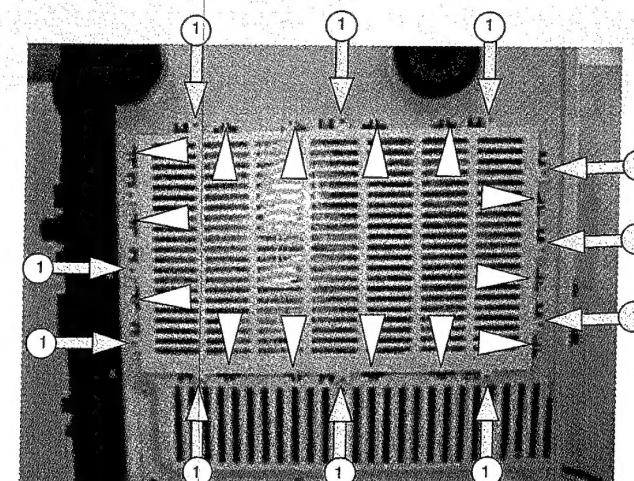
## Service position main trafo



picture 9

- 1) Put main trafo as shown in picture 9

## Handling service cover



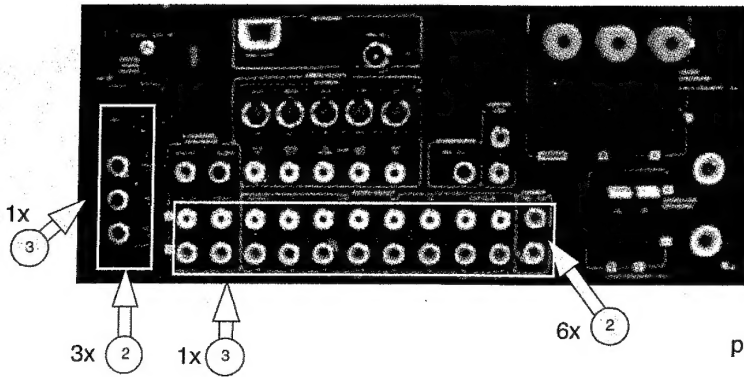
picture 10

- 1) To open the service cover cut 14 x lugs between cover and bottom . See picture 10 (▽)
  - 2) To close the service cover put 11 x screw in mentioned holes. See picture 10
- Service codenumber 12x Torx M3x6mm screw with big head = 4822 502 14659

# DISMANTLING HINTS

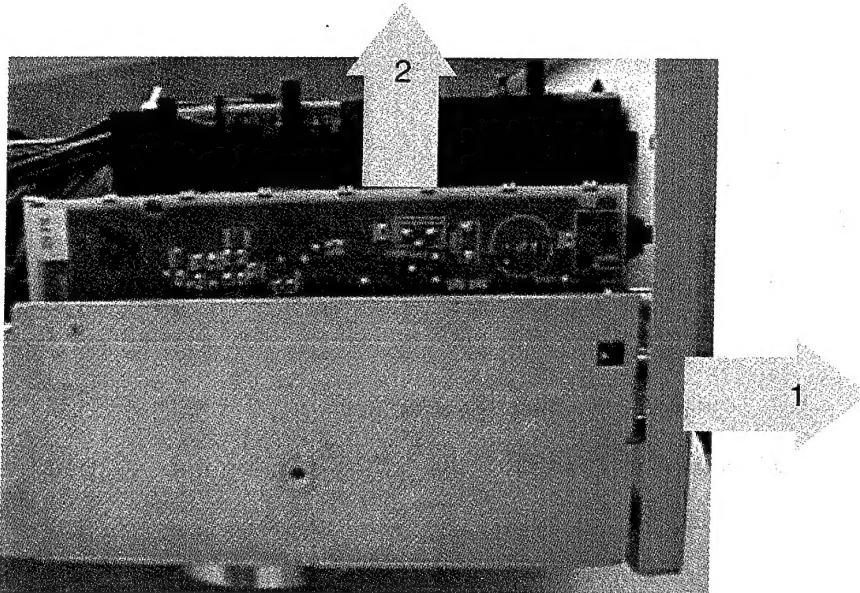
## Dismantling of MDM module

- 1) Remove all the screws mentioned in the arial . See picture 11



picture11

- 2) Remove backplate a little backwards. See arrow 1 (picture 12)
- 3) Pull module out the set as shown in picture 12

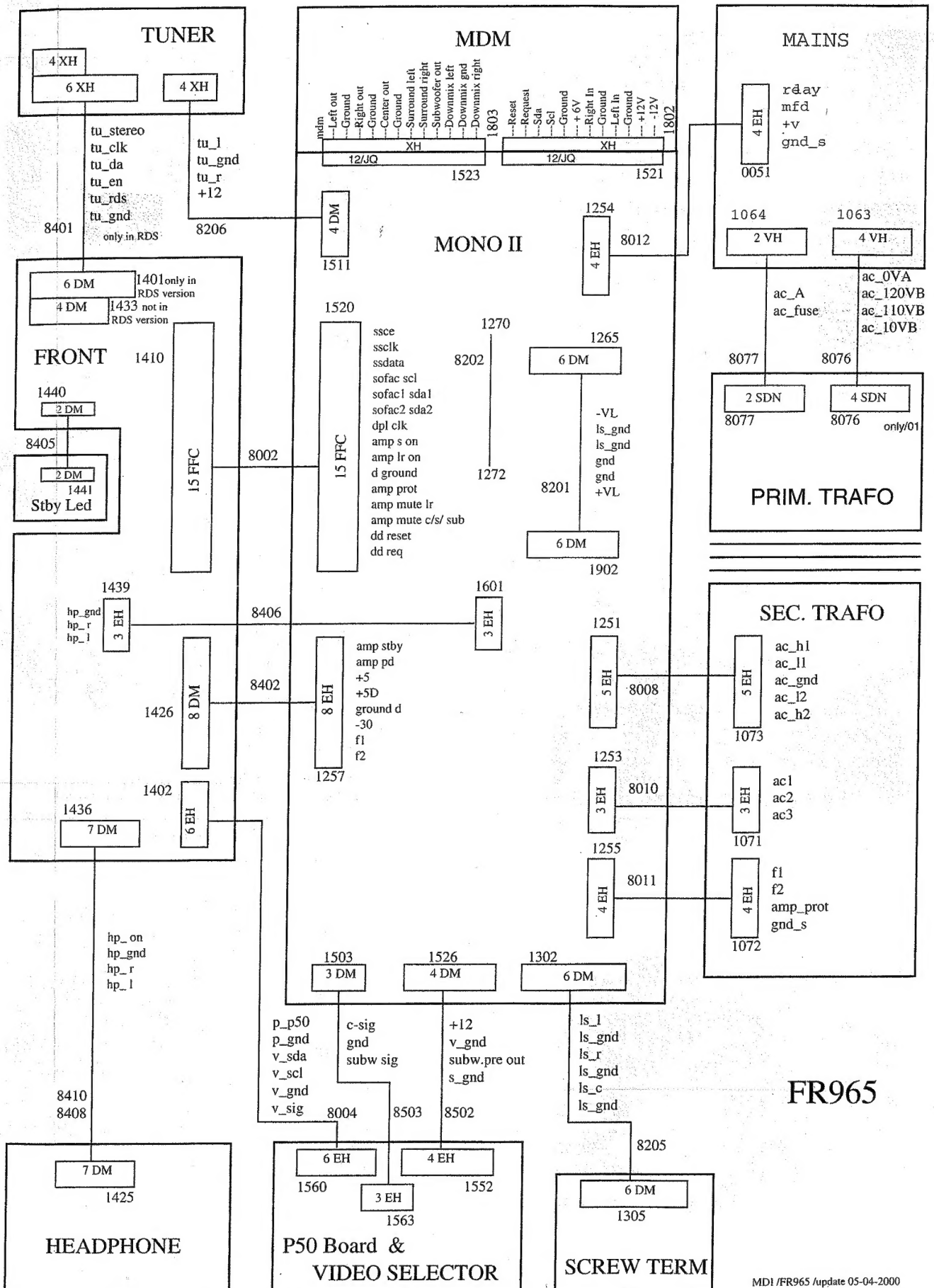


picture12

### Legend

- |       |                                       |                     |
|-------|---------------------------------------|---------------------|
| (1) → | = Torx M3x6mm ( screw with big head ) |                     |
| (2) → | = Torx 3x10mm                         | (3) → = Torx M3x6mm |

## WIRING DIAGRAM

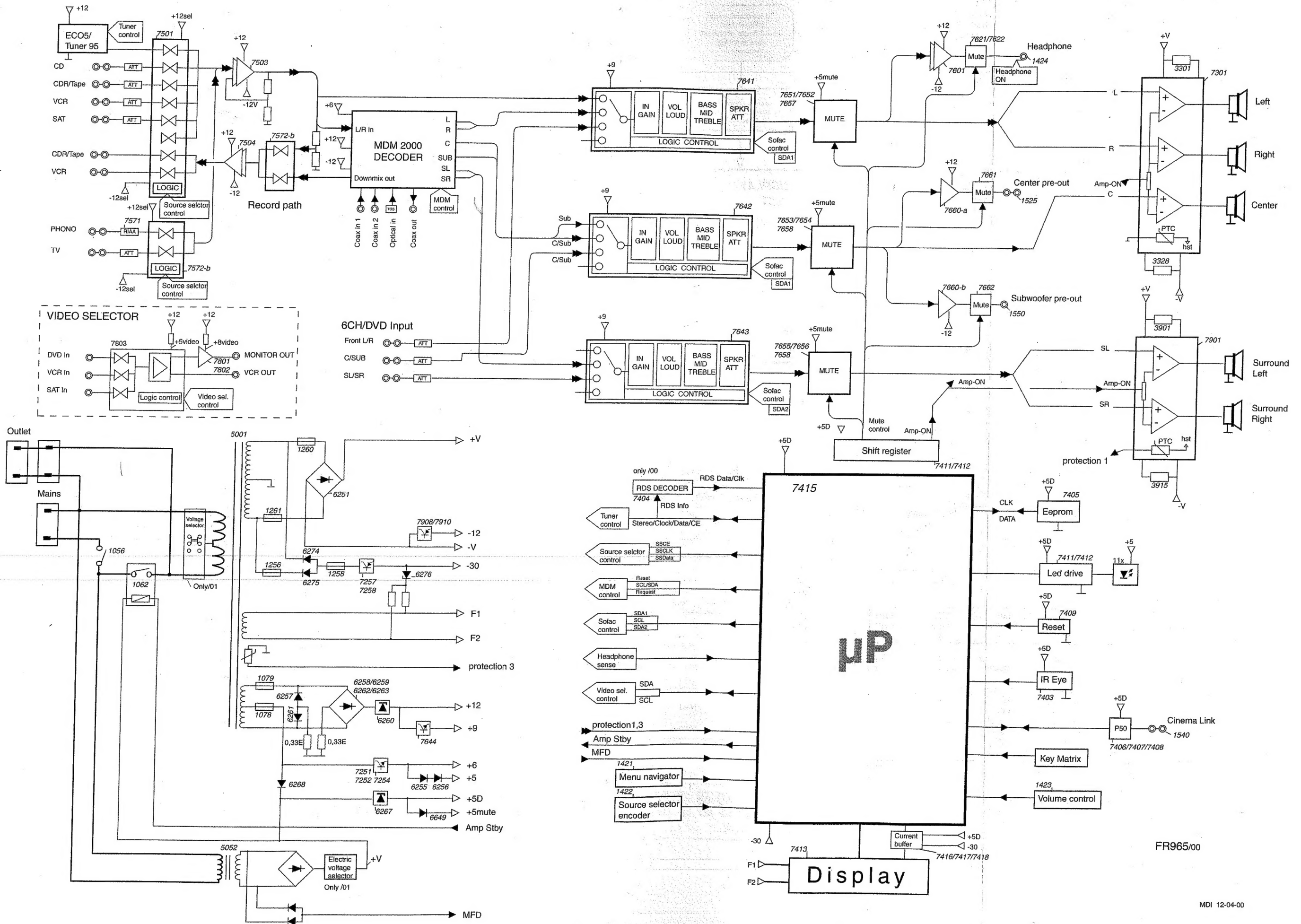




# BLOCKDIAGRAM

4-1

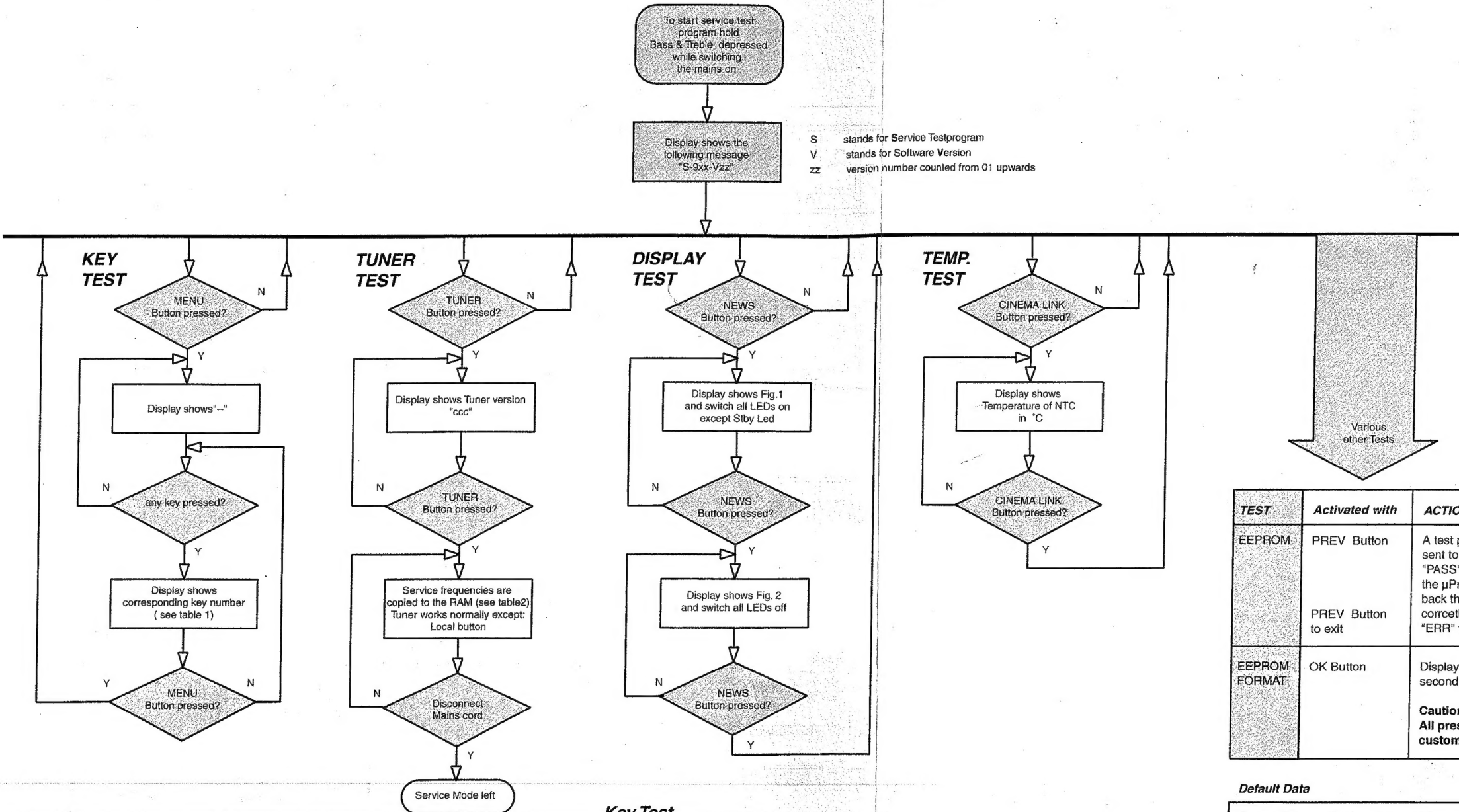
4-1



FR965/00

MDI 12-04-00

PCS 105 764



TEST	Activated with	ACTION
EEPROM	PREV Button	A test pattern will be sent to the Eeprom. "PASS" is displayed if the $\mu$ Processor read back the test pattern correctly, otherwise "ERR" will be displayed.
EEPROM FORMAT	PREV Button to exit	
EEPROM FORMAT	OK Button	Display shows "NEW" for 1 second.  <b>Caution!</b> All presets from the customer will be Lost

Default Data

Source =Tuner---Mode=stereo---Volume=10  
Bass=0---Treble=0---Loudness=Off  
#Effects: 3D Surr=100  
#Volume balance:  
Vol Front-L=0---Vol Front-R=0---Vol Center=0  
Vol Rear-L=0---Vol Rear-R=0---Vol Subwoofer=0  
#Speaker setup:  
Subwoofer Present=Yes---Center=Yes---Rear=Yes  
#Speaker Sizes:  
Front Size=Large--- Center Size=Large---Rear Size=Large  
#Speaker Distance:  
Dist L/R=3meter---Dist Center=3meter---Dist Rear=3meter

Tuner Test

Display info Version	Europe "EUR" /00	East Eur. 3-band "EEL" /14	East Eur. 2-band "EEU" /14	USA "USA" /17	Oversea "OSE" /01
Preset 1	87.5MHz	65.81MHz	65.81MHz	87.5MHz	87.5MHz
2	108MHz	108MHz	108MHz	108MHz	108MHz
3	531kHz	74MHz	74MHz	530kHz	531kHz
4	1602kHz	87.5MHz	87.5MHz	1700kHz	1602kHz
5	558kHz	531kHz	531kHz	560kHz	558kHz
6	1494kHz	1602kHz	1602kHz	1500kHz	1494kHz
7	153kHz	558kHz	558kHz	98MHz	---
8	279kHz	1494kHz	1494kHz	---	---
9	198kHz	153kHz	98MHz	---	---
10	98MHz	279kHz	70.01MHz	---	---
11	---	198kHz	---	---	98MHz

This table is valid for all types of tuners.  
Customer presets will not be changed after this Tuner test.  
If a station is tuned then the display flag "OK" will be ON otherwise it will be OFF.  
If the tuned frequency is carrying RDS information, the display flag "RDS" will be ON.  
Oversea version: the tuning grid can be switched between 9kHz and 10kHz by pressing the key "TUNER" for longer than 2 seconds. "Grid 9" or "Grid10" will be shown accordingly.  
Grid 9kHz is in FM 50kHz, Grid 10kHz is in FM 100kHz  
Europe version: the LW can be switched On and Off by pressing the key "TUNER" for longer than 2 seconds. LW OFF or LW ON will be shown accordingly.

Table 2

Key Test

Key	Number	Key	Number	Key	Number
Cinema	1	Sens	7	Loudness	13
Surr. on/off	2	News T/A	8	Bass	14
Surr. Mode	3	Prev.Exit	9	Treble	15
Virt. Mode	4	Setup Menu	--		
Tuner	5	Next	11		
Radio Text	6	Enter/OK	12		

Table 1

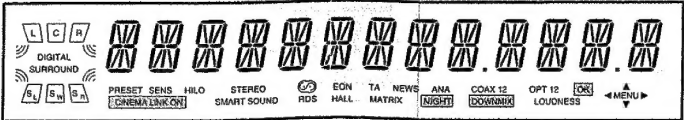


Figure 1

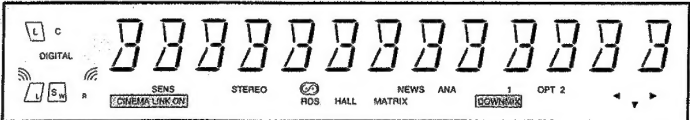
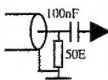



Figure 2

**TUNER 95 bis Adjustment Table (FM, MW, LW with Frame antenna)**

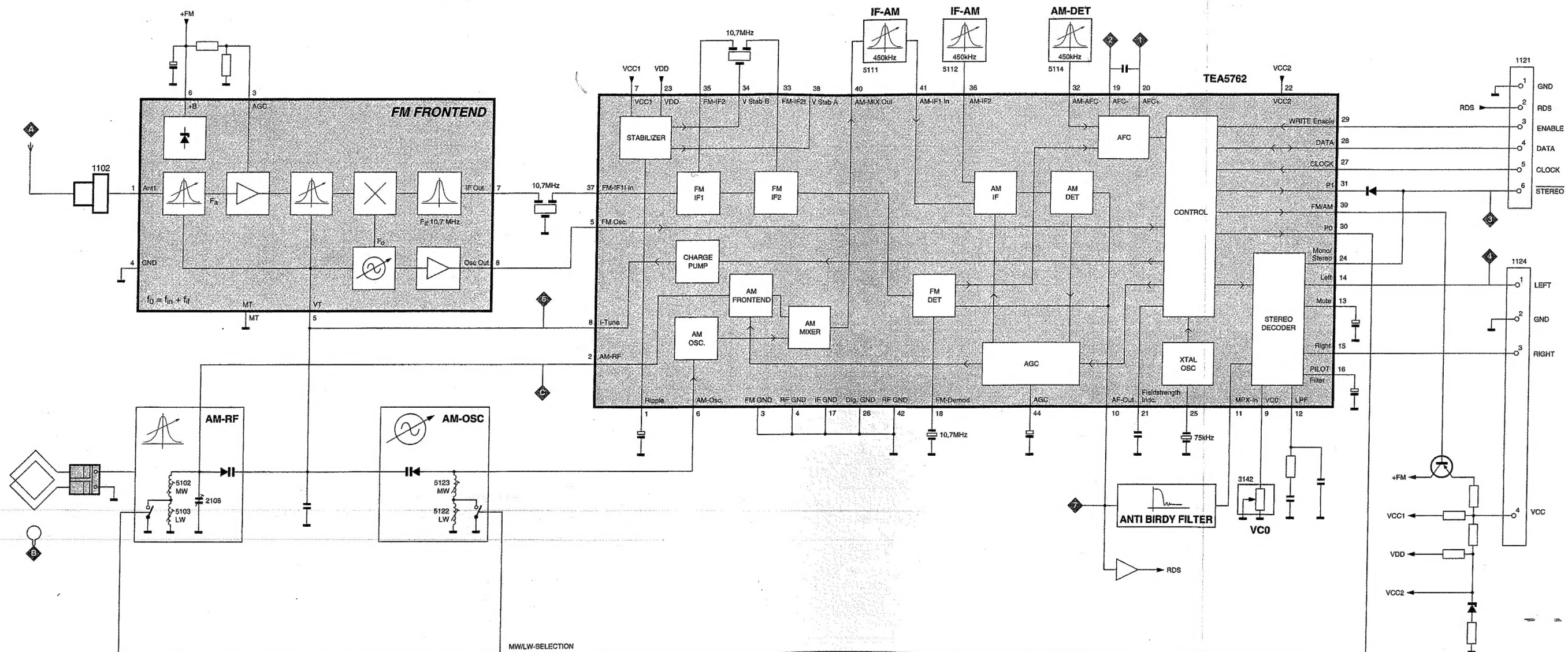
Waverange	Input frequency	Input	Set tuned to	Adjust	Output	Scope / Voltmeter
VARICAP ALIGNMENT						
FM (50) 87.5 - 108 MHz			108 MHz	check	6	7 ... 9V
			87.5 MHz	check		1.3 ... 2V
MW (9) 531 - 1602 kHz			1602 kHz	5123		8.3V ± 0.2V
			531 kHz	check		1V ± 0.4V
LW (3) 153 - 279 kHz			279 kHz	5122		8.3V ± 0.2V
			153 kHz	check		1V ± 0.4V
FM - DETECTION						
FM	98 Mhz 1mV continuous wave  short pin 21 (IC7101) to ground	A	98 MHz	5107	1 2	0mV ± 3mV
FM - VCO						
FM	98 Mhz 1 mV  continuous wave	A	98 MHz	3142	3	152kHz ± 1 kHz
DISTORTION						
FM	98 Mhz 1 mV 90 % L + 9 % pilot mod = 1kHz	A	98MHz	mixcoil inside Tuner 1110	4	Distortion minimum
AM - IF						
MW	450kHz Δf = 10kHz Low as possible Swept signal	  C	MW	5111	7	symmetrical and max. height
	5112					
	450kHz  continuous wave			5114	1 2	0mV ± 2mV
AM - RF						
MW	558kHz Mod = 1kHz 30 % AM 1494 kHz	B	558kHz	5102	7	MAX
			1494kHz	2106		
LW	198kHz mod = 1kHz 30 % AM		*	198kHz		5103

\* Signal send via a frame antenna  
(..) = tuning grid in kHz

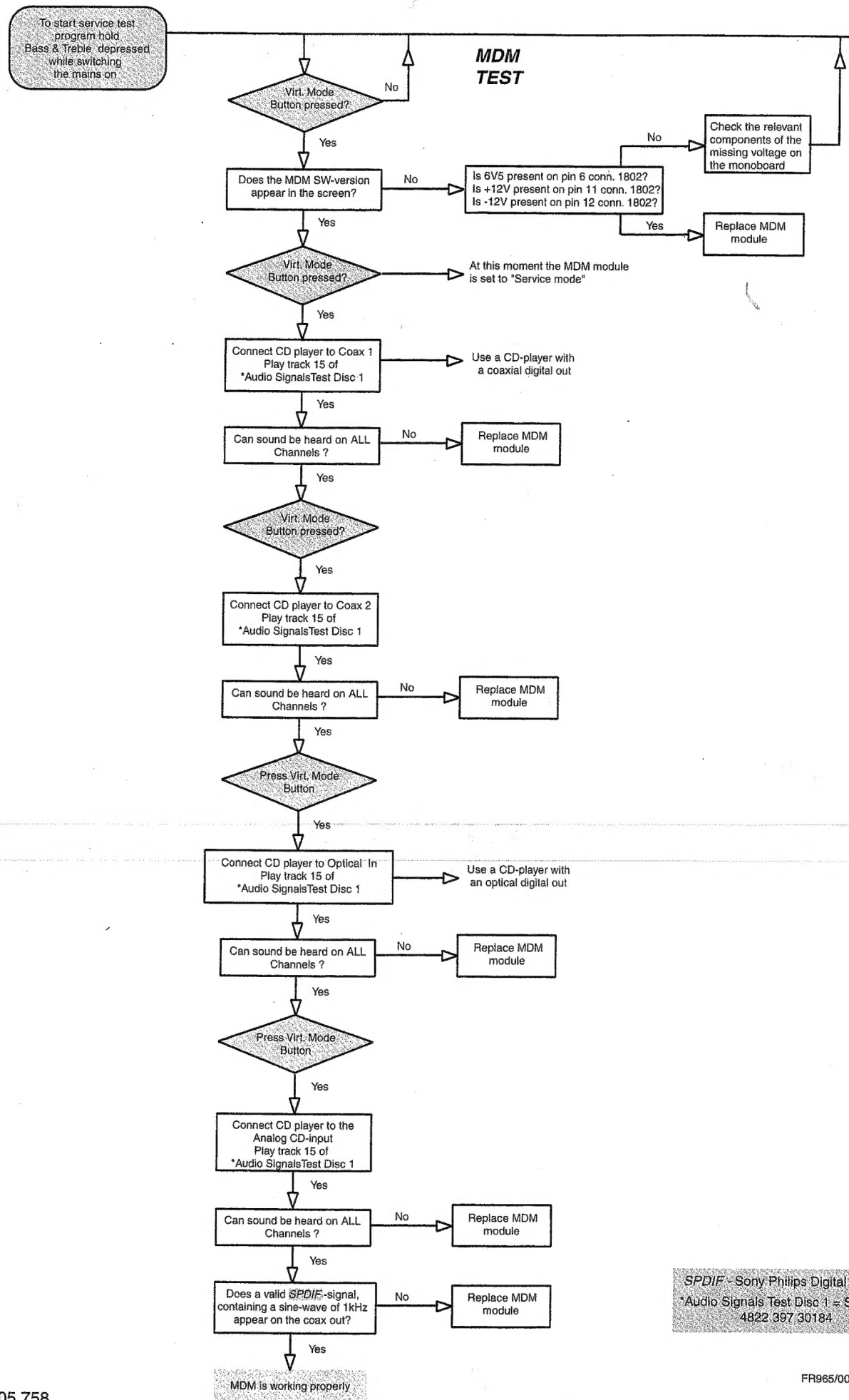
 repeat

adjustable for 3104 217 04121/04341



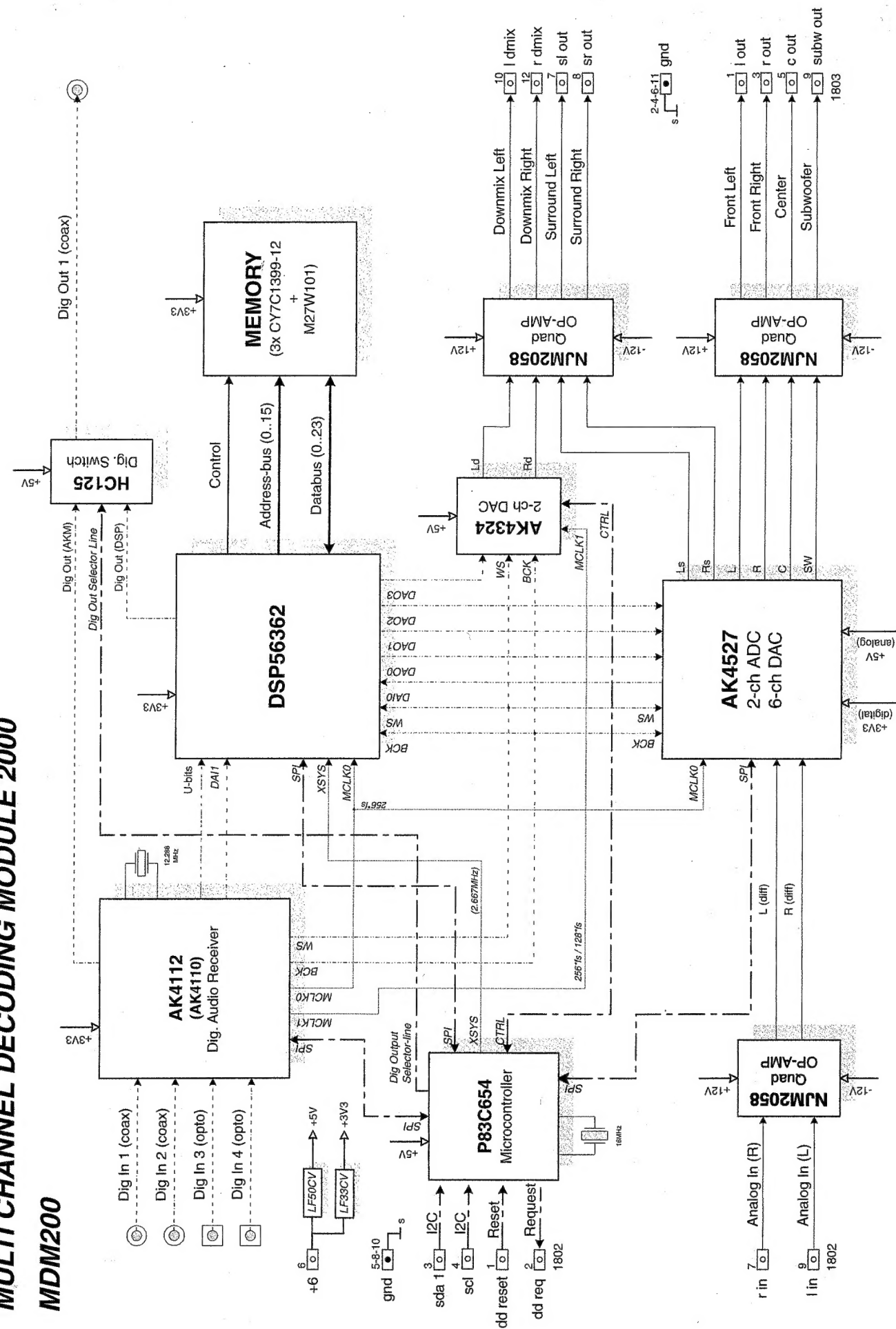


## MULTI-CHANNEL DECODING MODULE - Troubleshooting



SPDIF - Sony Philips Digital Inter Face  
\*Audio Signals Test Disc 1 = SBC428  
4822 397 30184

## BLOCK-DIAGRAM

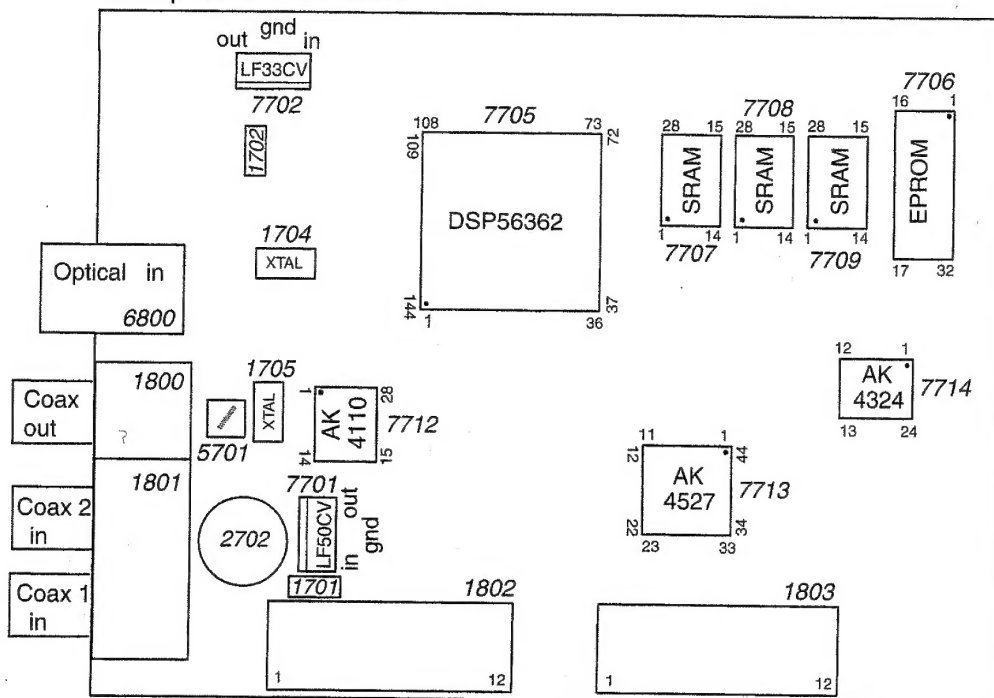
MULTI CHANNEL DECODING MODULE 2000  
MDM200

**ELECTRICAL PARTSLIST - MDM MODULE**

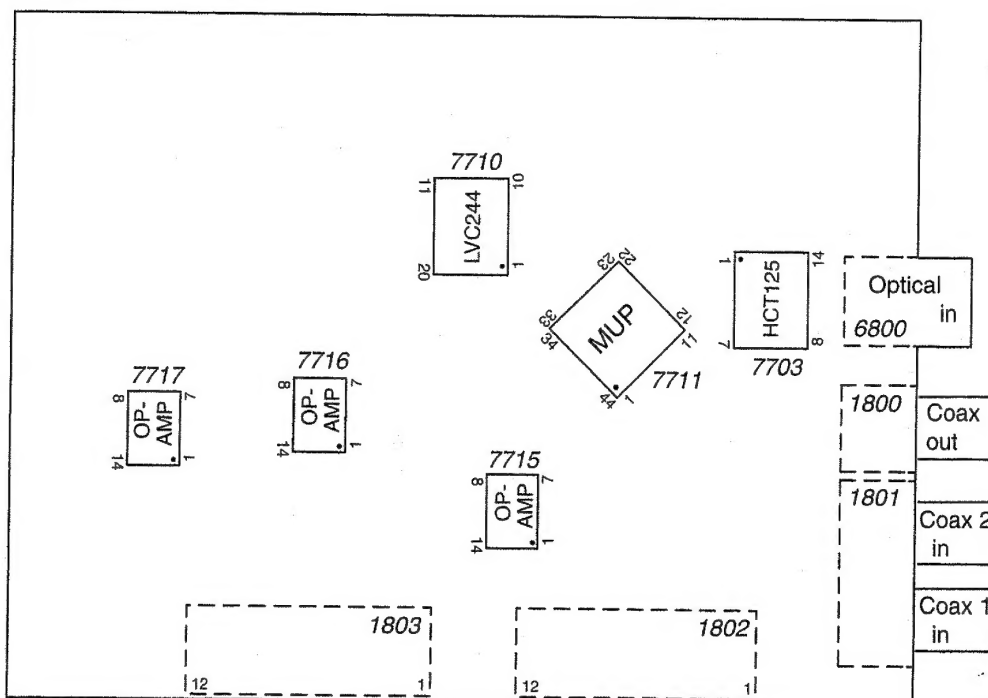
1003	3104 217 06780	MDM MODULE for FR965	2702	4822 123 14025	16V 2200U 20%
1701	4822 252 51172	FUSE 0,315A	6800	4822 218 11487	CONN. FIBER-GLASS GP1F32R
1702	4822 252 51172	FUSE 0,315A	7701	9322 146 09687	LF50CV
1704	2422 543 01118	CRYSTAL 16MHZ	7702	4822 209 16978	LF33CV
1705	2422 543 01132	CRYSTAL 12MH28			
1800	4822 267 31729	COAX OUT CONN.			
1801	4822 267 31448	COAX IN CONNECTOR			
1802	2422 025 10253	CON 12P. MALE			
1803	2422 025 10253	CON 12P. MALE			

Note: Only the parts mentioned in this list are normal service parts.

Component side view



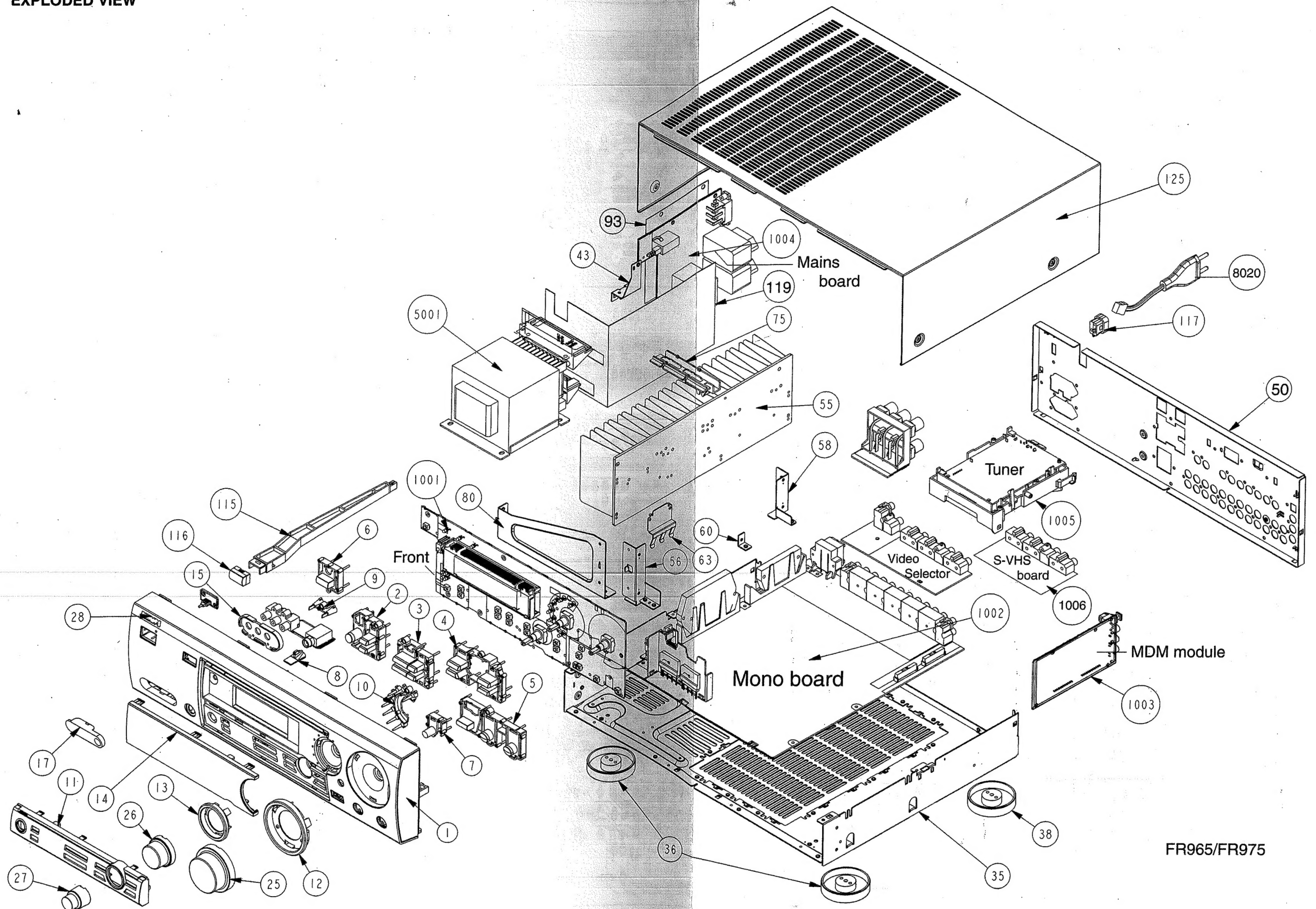
Copper side view



# EXPLODED VIEW

11

11



FR965/FR975

SCALE 0.250



**PARTSLIST - EXPLODED VIEW****MECHANICAL PARTS FR965/00**

1	3104 217 52930	FRONT ASSY
2	4822 410 12442	BUTTON HINGE ASSY SURR.
3	4822 410 12435	BUTTONS HINGE TUNER
4	4822 410 12443	BUTTON HINGE ASSY MENU
5	4822 410 12436	BUTTONS HINGE BASS TREBLE
6	4822 410 12437	BUTTONS EASY LINK
8	4822 380 10274	LIGHT GUIDE SURROUND
9	3104 214 38460	LIGHT GUIDE VIRTUAL/HALL
10	4822 380 10277	LIGHT GUIDE SELECTOR
11	3104 217 52760	ORNAMENTAL PLATE ASSY
12	3104 217 52130	RING KNOB VOLUME
13	3104 217 52140	RING KNOB SOURCE SEL.
14	3104 217 52910	WINDOW DISPLAY ASSY
25	4822 410 12438	KNOB VOLUME
26	4822 410 12439	KNOB SOURCE SELECTOR
27	4822 410 12441	KNOB MENU NAV
28	4822 459 10887	BADGE PHILIPS
36	4822 691 10773	LEG SILVER
38	4822 691 10773	LEG SILVER
115	4822 535 10638	POWER ROD
116	4822 462 11176	POWER CAP
117	4822 532 60948	BUSCH
125	4822 442 01817	COVERPLATE

**ELECTRICAL PARTS**

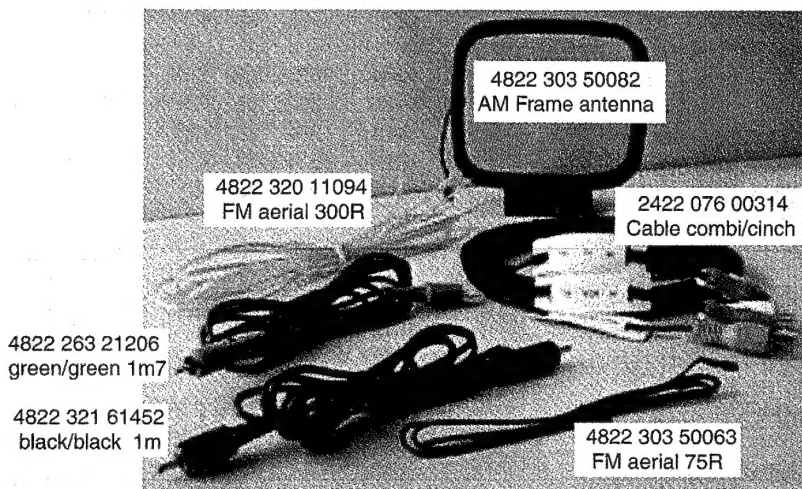
1003	3104 217 06780	MDM 2000 V2
5001▲	3104 218 30980	MAINS TRAFO
8020▲	4822 321 11139	POWER CORD

**MISCELLANEOUS PARTS**

4822 303 50063	FM AERIAL 75R
2422 076 00314	CABLE COMB/CINCH
4822 303 50082	AM FRAME
3104 219 04310	IRT PROD. ASSY
4822 321 61452	CABLE ASSY CINCH/CINCH
3103 306 17010	INSTR.FOR USE

**MECHANICAL PARTS FR966/00S**

1	3104 217 53030	FRONT ASSY
2	3104 217 53130	BUTTON HINGE SURR.
3	3104 217 53140	BUTTON HINGE TUNER
4	3104 217 53120	BUTTON HINGE MENU
5	3104 217 53150	BUTTON HINGE BASS TREBLE
6	3104 217 53110	BUTTON HINGE EASY LINK
8	4822 380 10274	LIGHT GUIDE SURROUND
9	3104 214 38460	LIGHT GUIDE VIRTUAL/HALL
10	4822 380 10277	LIGHT GUIDE SELECTOR
11	3104 217 53040	ORNAMENTAL PLATE
12	3104 217 53080	RING KNOB VOLUME
13	3104 217 53090	RING KNOB SOURCE SEL.
14	3104 217 52910	WINDOW DISPLAY ASSY
25	3104 217 53050	KNOB VOLUME
26	3104 217 53060	KNOB SOURCE SELECTOR
27	3104 217 53070	KNOB MENU NAV
28	4822 459 10887	BADGE PHILIPS
36	4822 691 10773	LEG SILVER
38	4822 691 10773	LEG SILVER
115	4822 535 10638	POWER ROD
116	3104 217 53100	POWER CAP
117	4822 532 60948	BUSCH
125	3104 211 29730	COVERPLATE



note: Only the parts mentioned in this list are normal service parts